

FIG. 1

CONSTRUCTION OF IEEE 1394 BUS TO WHICH
CONVENTIONAL BUS ANALYZER IS CONNECTED

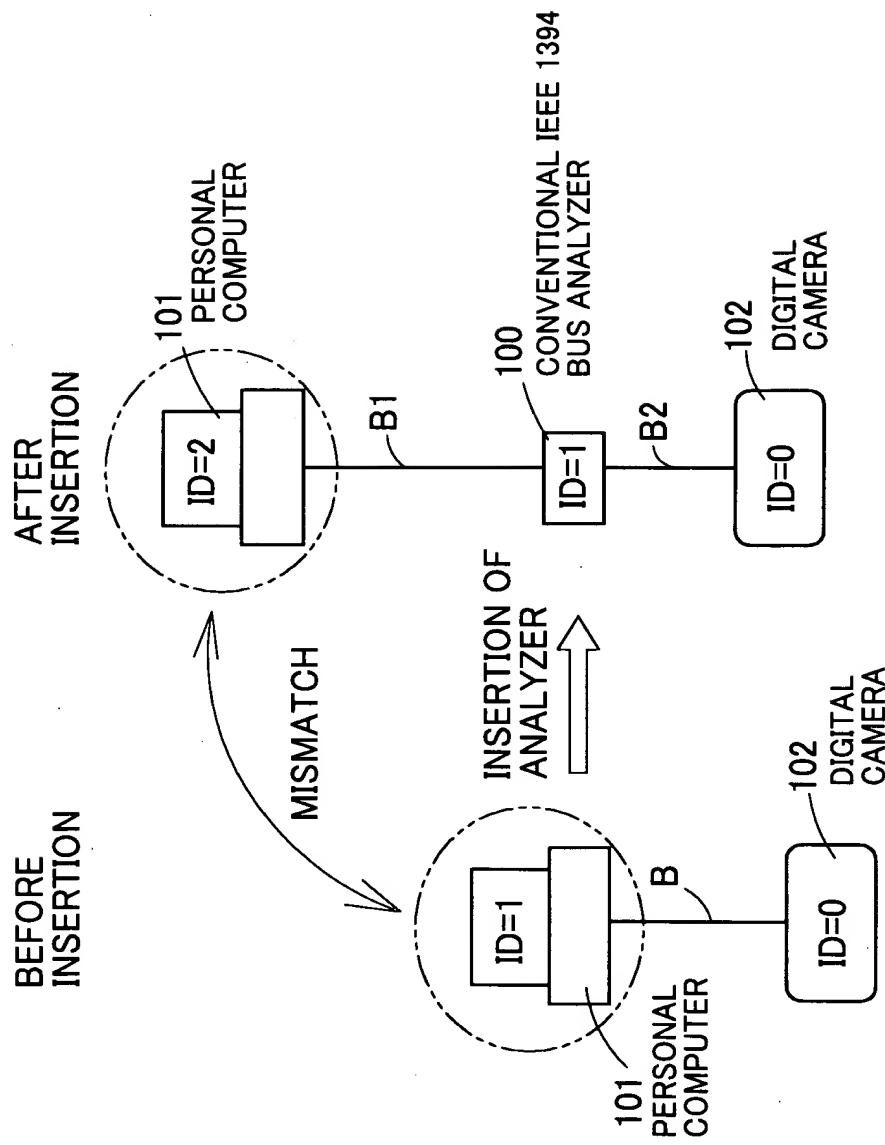


FIG. 2

CONSTRUCTION IN WHICH CONVENTIONAL BUS ANALYZER IS CONNECTED TO IEEE 1394 BUS TO WHICH A NUMBER OF DEVICES ARE CONNECTED

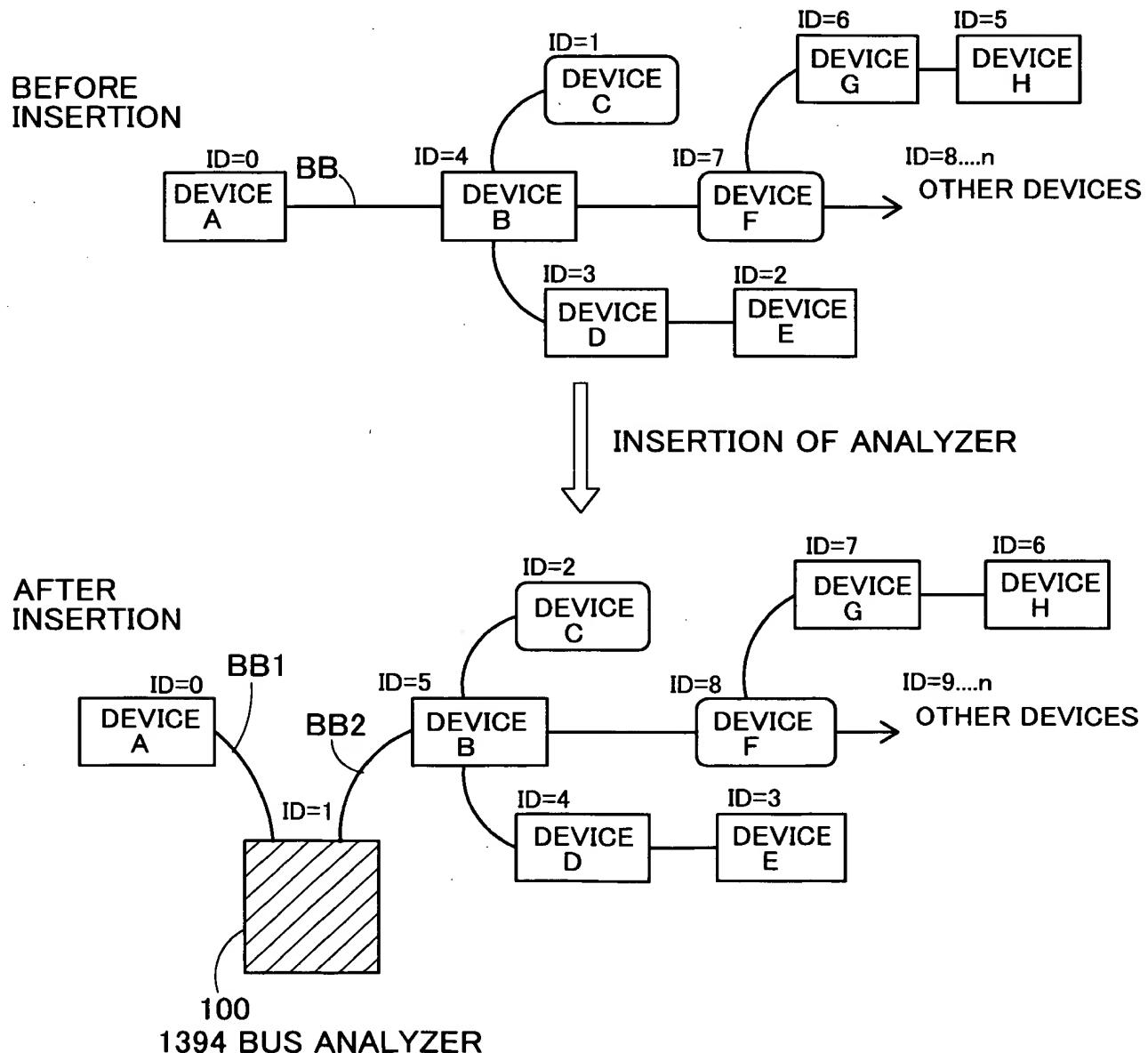
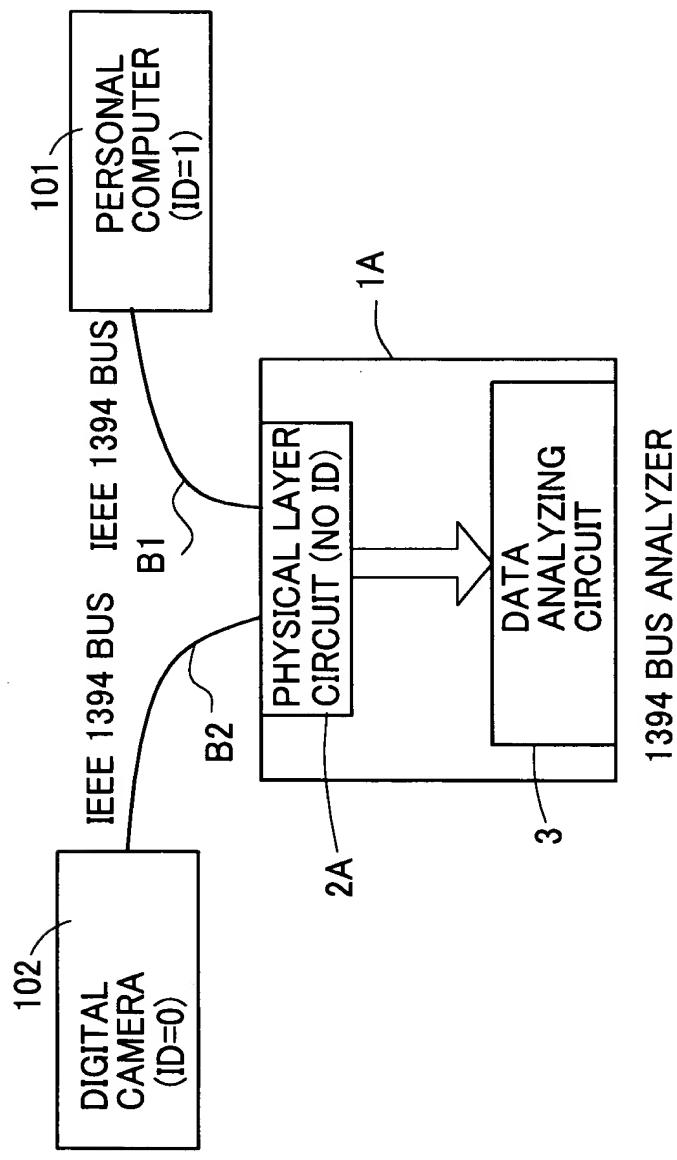


FIG. 3 CONSTRUCTION IN WHICH BUS ANALYZER OF FIRST EMBODIMENT
IS CONNECTED TO IEEE 1394 BUS



1394 BUS ANALYZER

FIG. 4
STATE TRANSITION DIAGRAM SHOWING TREE—IDENTIFYING OPERATION
IN FIRST EMBODIMENT

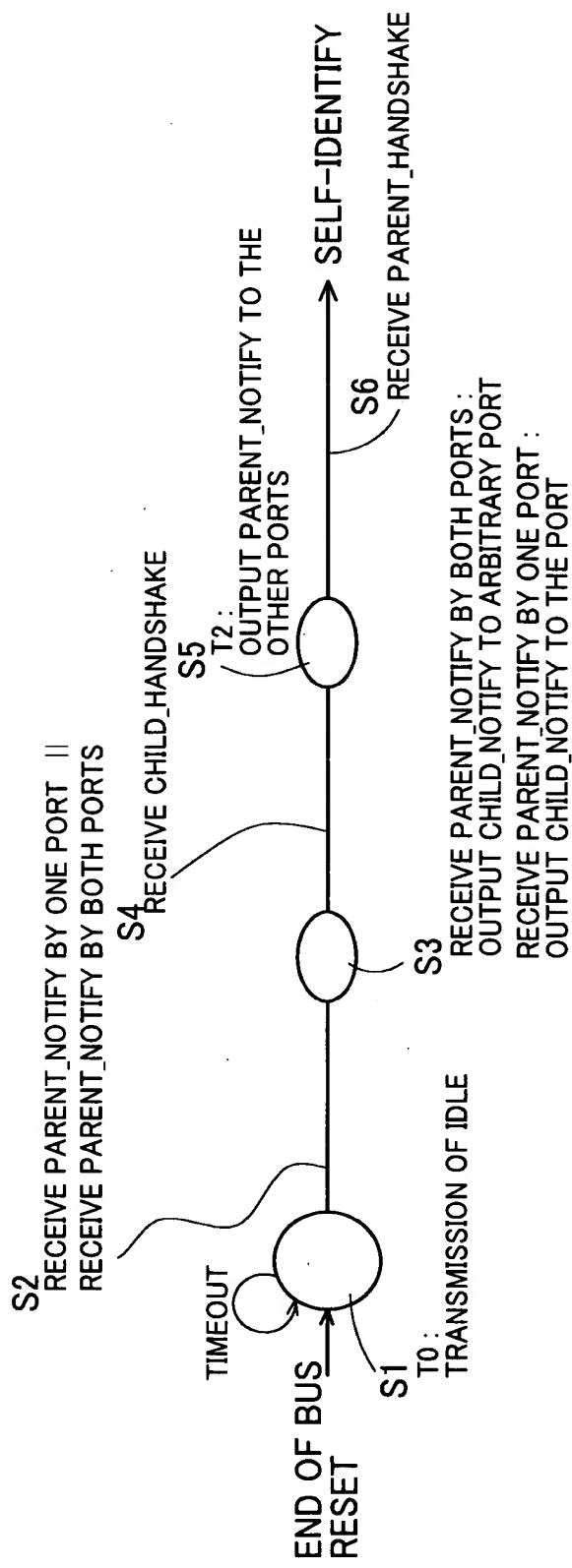


FIG. 5

STATE TRANSITION DIAGRAM SHOWING SELF-IDENTIFYING
OPERATION IN FIRST EMBODIMENT

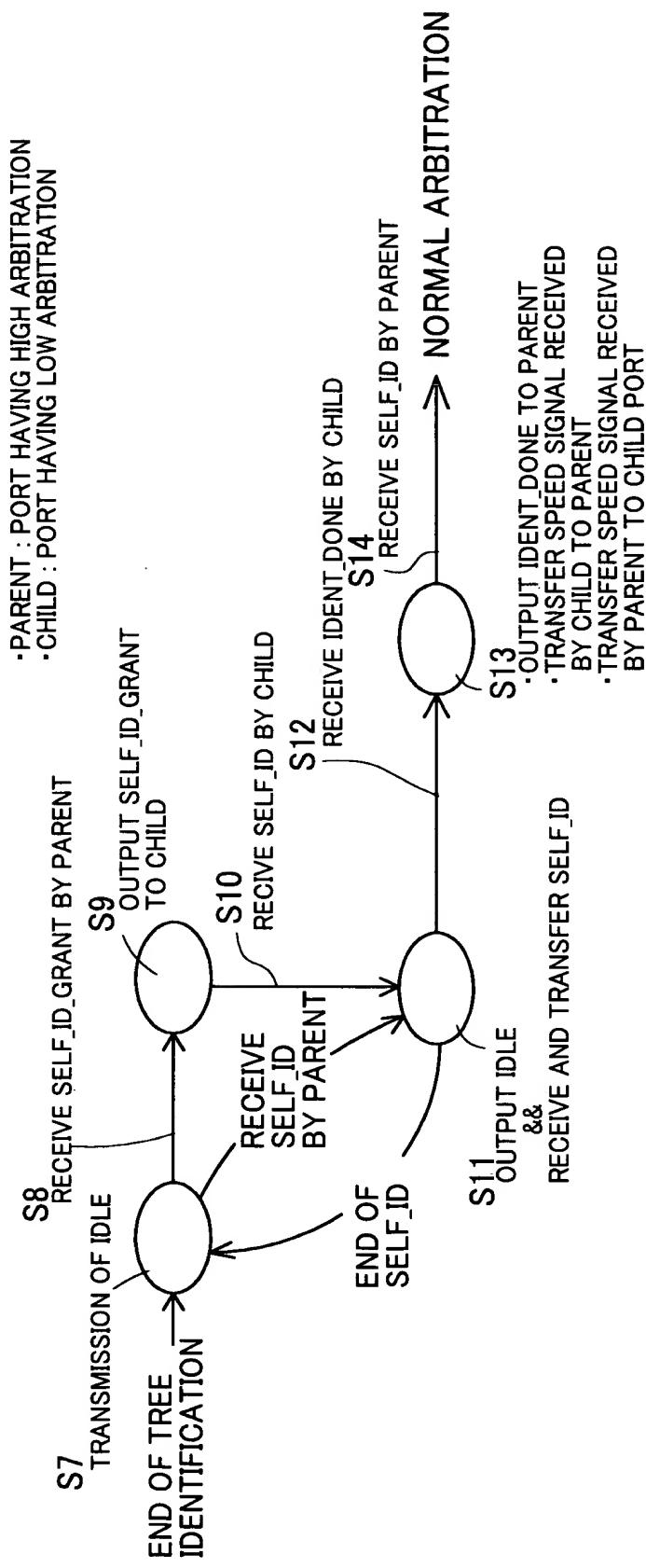
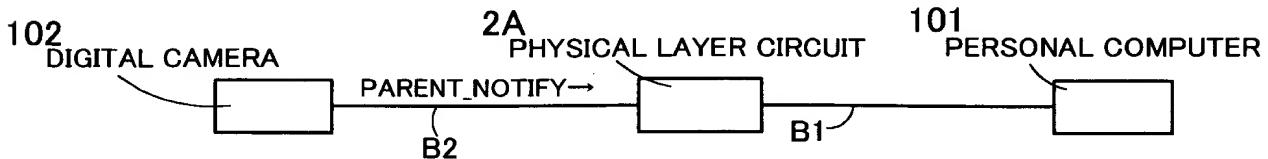


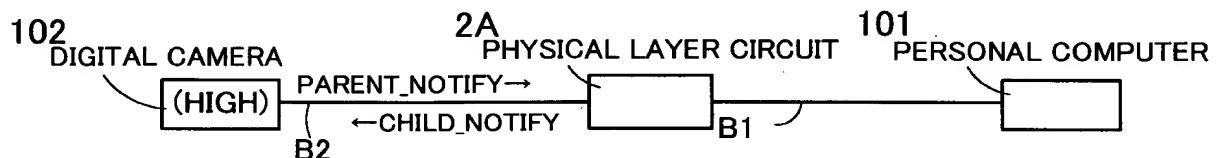
FIG. 6

TREE-IDENTIFYING OPERATION IN FIRST EMBODIMENT
(RECEIVE PARENT_NOTIFY BY ONE OF PORTS)

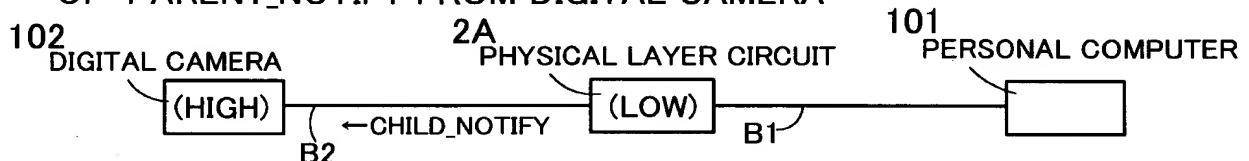
(P1) RECEIVE PARENT_NOTIFY FROM DIGITAL CAMERA



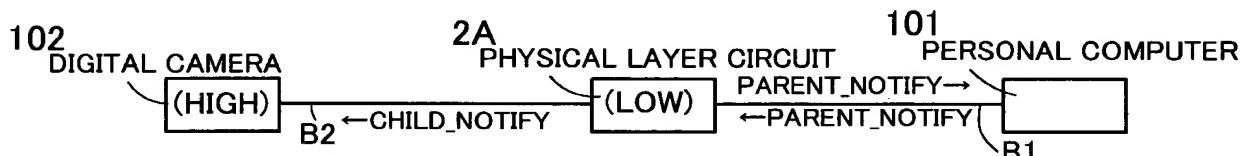
(P2) OUTPUT CHILD_NOTIFY TO DIGITAL CAMERA



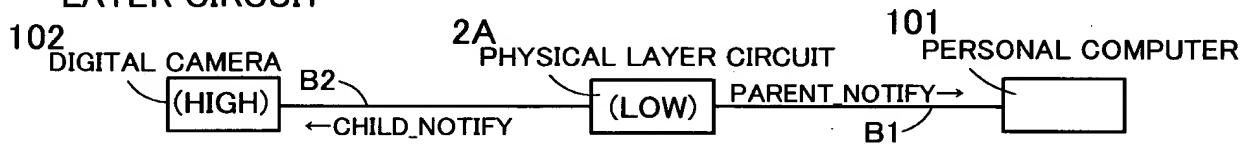
(P3) RECEIVE CHILD_HANDSHAKE BY STOPPING OUTPUT OF PARENT_NOTIFY FROM DIGITAL CAMERA



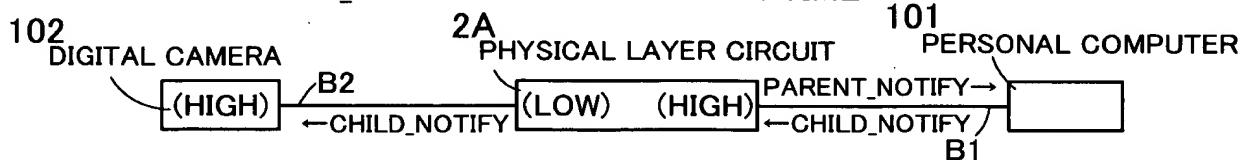
(P4) OUTPUT PARENT_NOTIFY TO THE OTHER PORT RECEIVE ROOT_CONTENTION WHEN PERSONAL COMPUTER ALSO OUTPUTS PARENT_NOTIFY AT THIS TIME



(P5) STOP OUTPUTTING PARENT_NOTIFY FROM PERSONAL COMPUTER BUT CONTINUOUSLY OUTPUT PARENT_NOTIFY FROM PHYSICAL LAYER CIRCUIT



(P6) RECEIVE PARENT_HANDSHAKE WHEN PERSONAL COMPUTER OUTPUTS CHILD_NOTIFY AFTER RANDOM TIME



(P12) STOP OUTPUTTING SIGNALS FROM BOTH PORTS, THEREBY FINISHING TREE-IDENTIFYING OPERATION

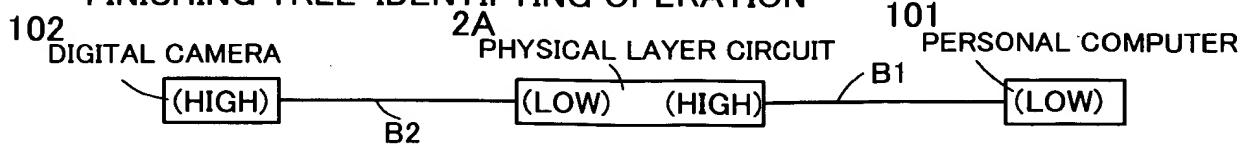
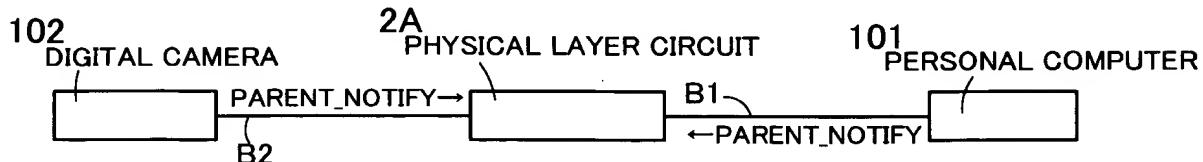


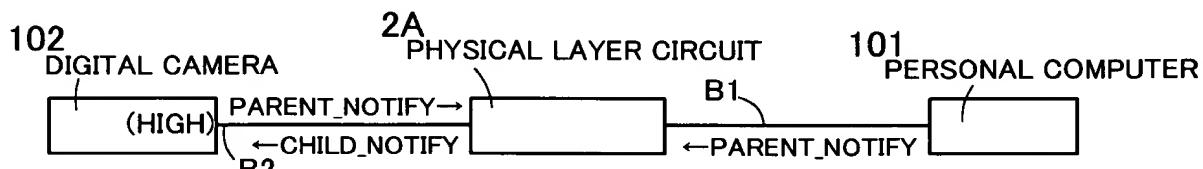
FIG. 7

TREE-IDENTIFYING OPERATION IN FIRST EMBODIMENT
(RECEIVE PARENT_NOTIFY BY BOTH PORTS)

(P7) RECEIVE PARENT_NOTIFY FROM BOTH DEVICES

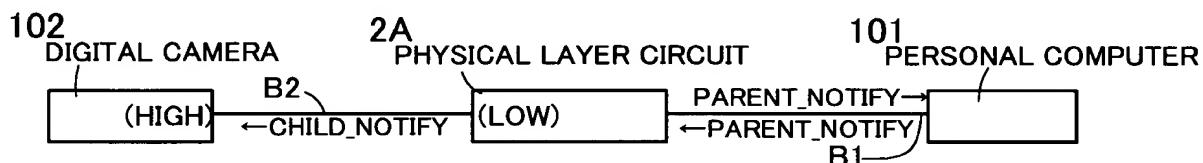


(P8) OUTPUT CHILD_NOTIFY TO DIGITAL CAMERA

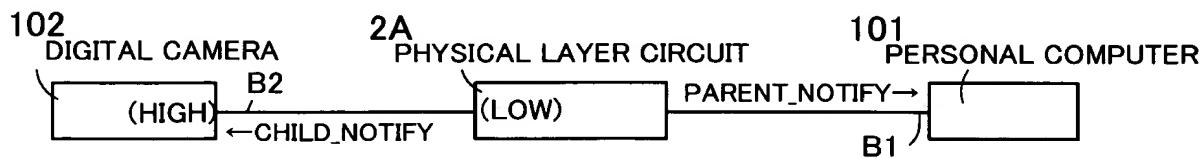


(P9) STOP OUTPUTTING PARENT_NOTIFY FROM DIGITAL CAMERA TO THEREBY RECEIVE CHILD_HANDSHAKE, AND OUTPUT PARENT_NOTIFY TO PERSONAL COMPUTER.

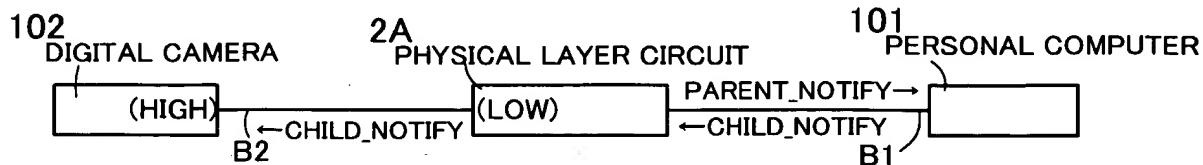
RECEIVE ROOT_CONTENTION WHEN PERSONAL COMPUTER ALSO OUTPUTS PARENT_NOTIFY AT THIS TIME.



(P10) STOP OUTPUTTING PARENT_NOTIFY FROM PERSONAL COMPUTER BUT CONTINUOUSLY OUTPUT PARENT_NOTIFY FROM PHYSICAL LAYER CIRCUIT



(P11) OUTPUT CHILD_NOTIFY FROM PERSONAL COMPUTER AFTER RANDOM TIME, THEREBY RECEIVING PARENT_HANDSHAKE



(P12) FINISH TREE-IDENTIFYING OPERATION

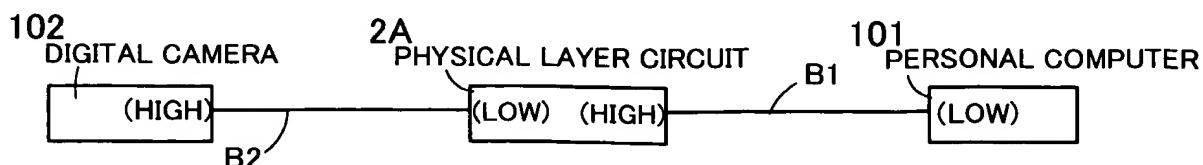
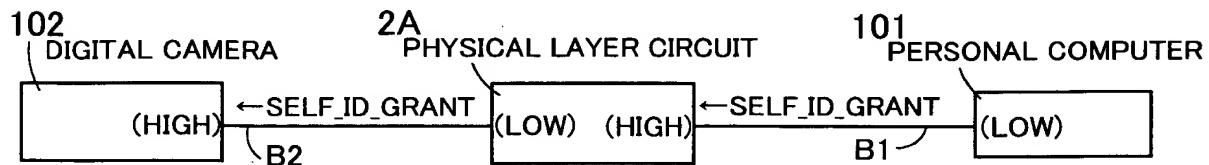


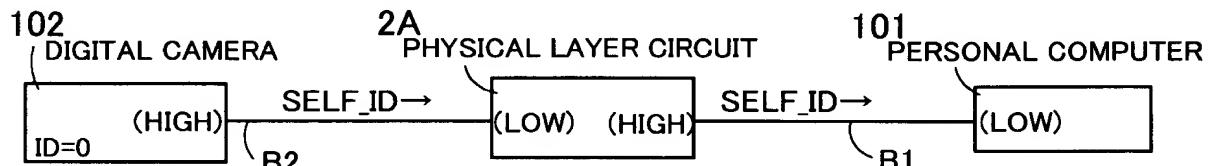
FIG. 8

SELF-IDENTIFYING OPERATION IN FIRST EMBODIMENT

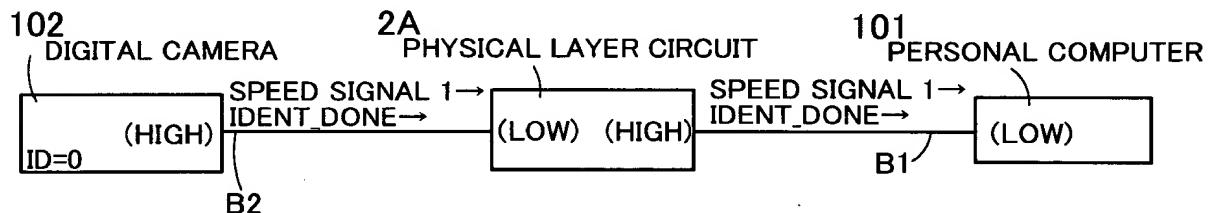
(P13) RECEIVE SELF_ID_GRANT FROM PERSONAL COMPUTER AND TRANSFER IT TO DIGITAL CAMERA



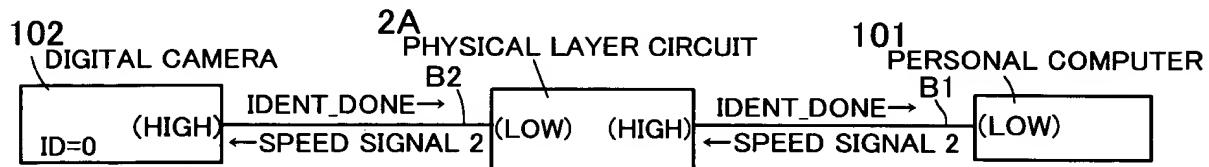
(P14) RECEIVE SELF_ID PACKET FROM DIGITAL CAMERA AND TRANSFER IT TO PERSONAL COMPUTER



(P15) RECEIVE IDENT_DONE PACKET AND SPEED SIGNAL FROM DIGITAL CAMERA AND TRANSFER THEM TO PERSONAL COMPUTER



(P16) RECEIVE SPEED SIGNAL FROM PERSONAL COMPUTER AND TRANSFER IT TO DIGITAL CAMERA



(P17) RECEIVE SELF_ID PACKET FROM PERSONAL COMPUTER AND FINISH SELF_IDENTIFYING OPERATION

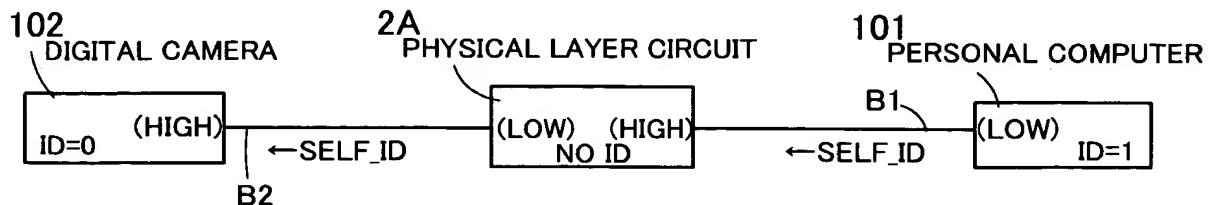


FIG. 9

FIRST MODIFICATION OF BUS ANALYZER IN FIRST EMBODIMENT

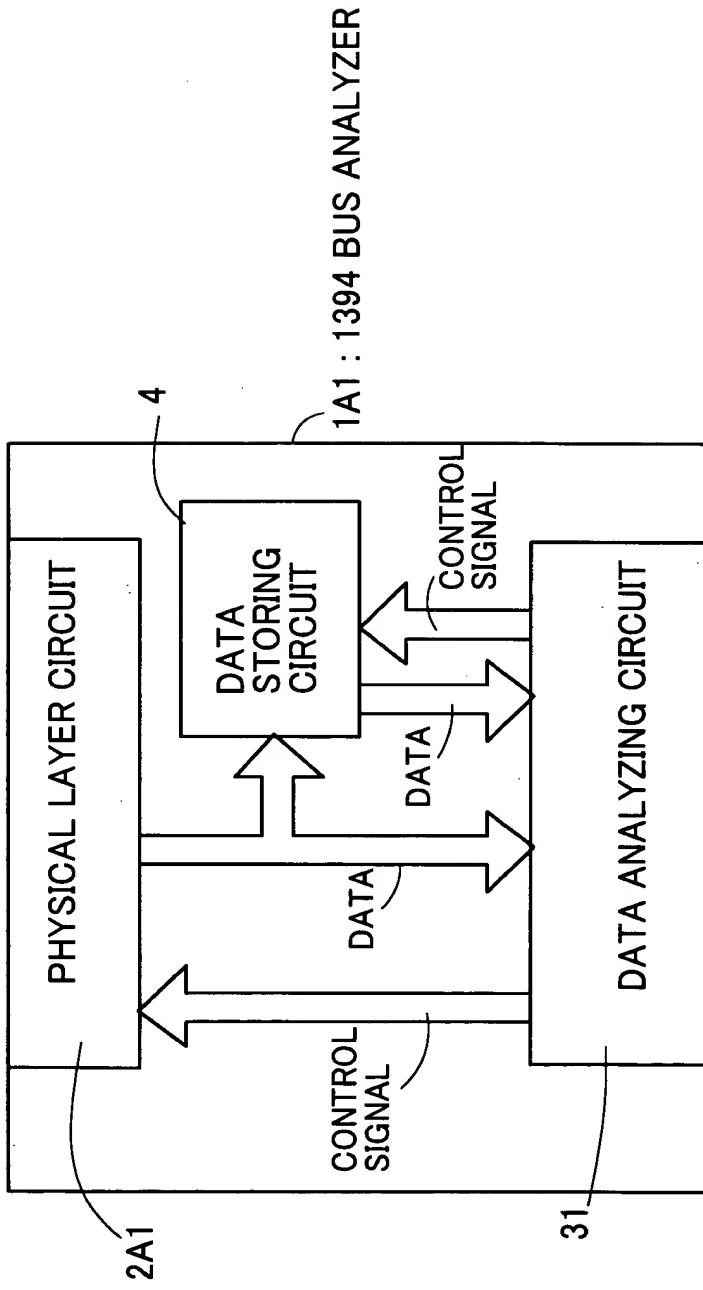
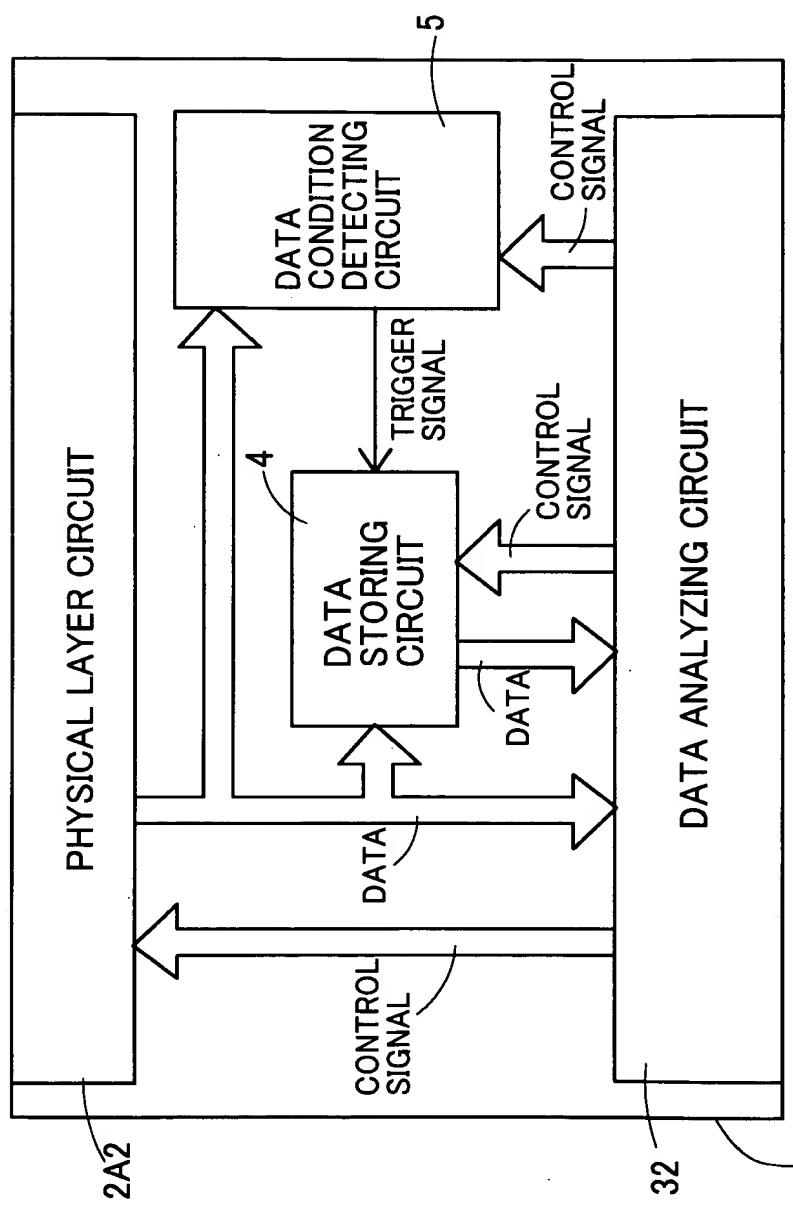


FIG. 10

SECOND MODIFICATION OF BUS ANALYZER IN FIRST EMBODIMENT



1A2 : 1394 BUS ANALYZER

FIG. 11

THIRD MODIFICATION OF BUS ANALYZER IN FIRST EMBODIMENT

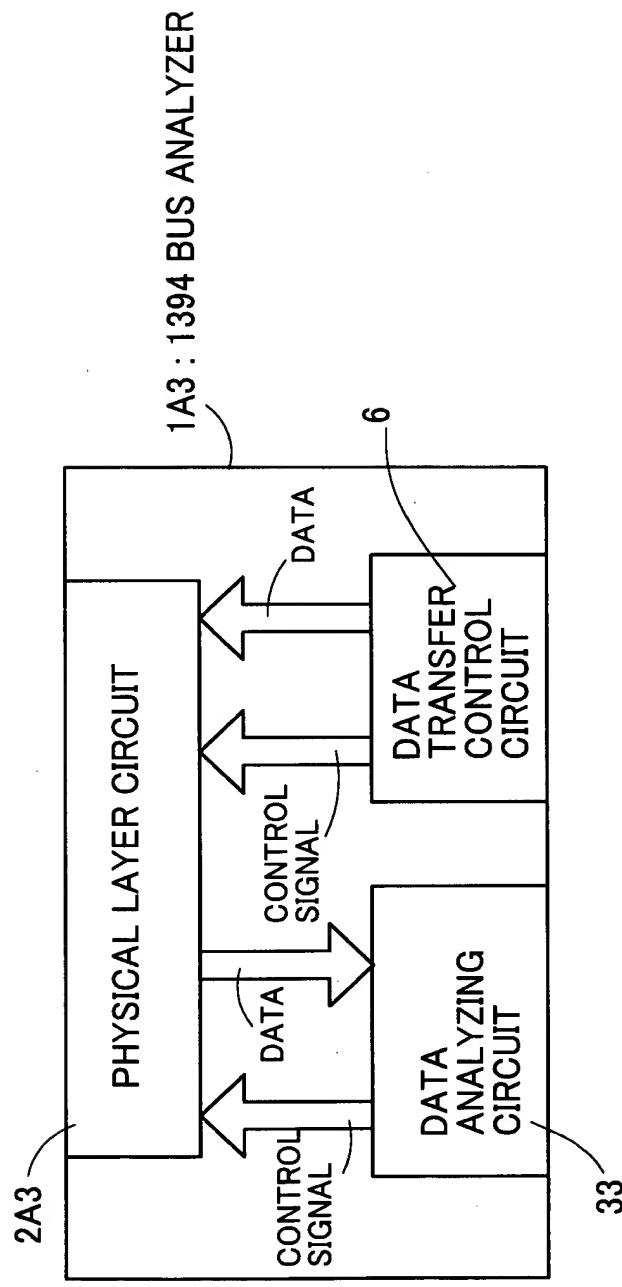


FIG. 12
FOURTH MODIFICATION OF BUS ANALYZER IN FIRST EMBODIMENT

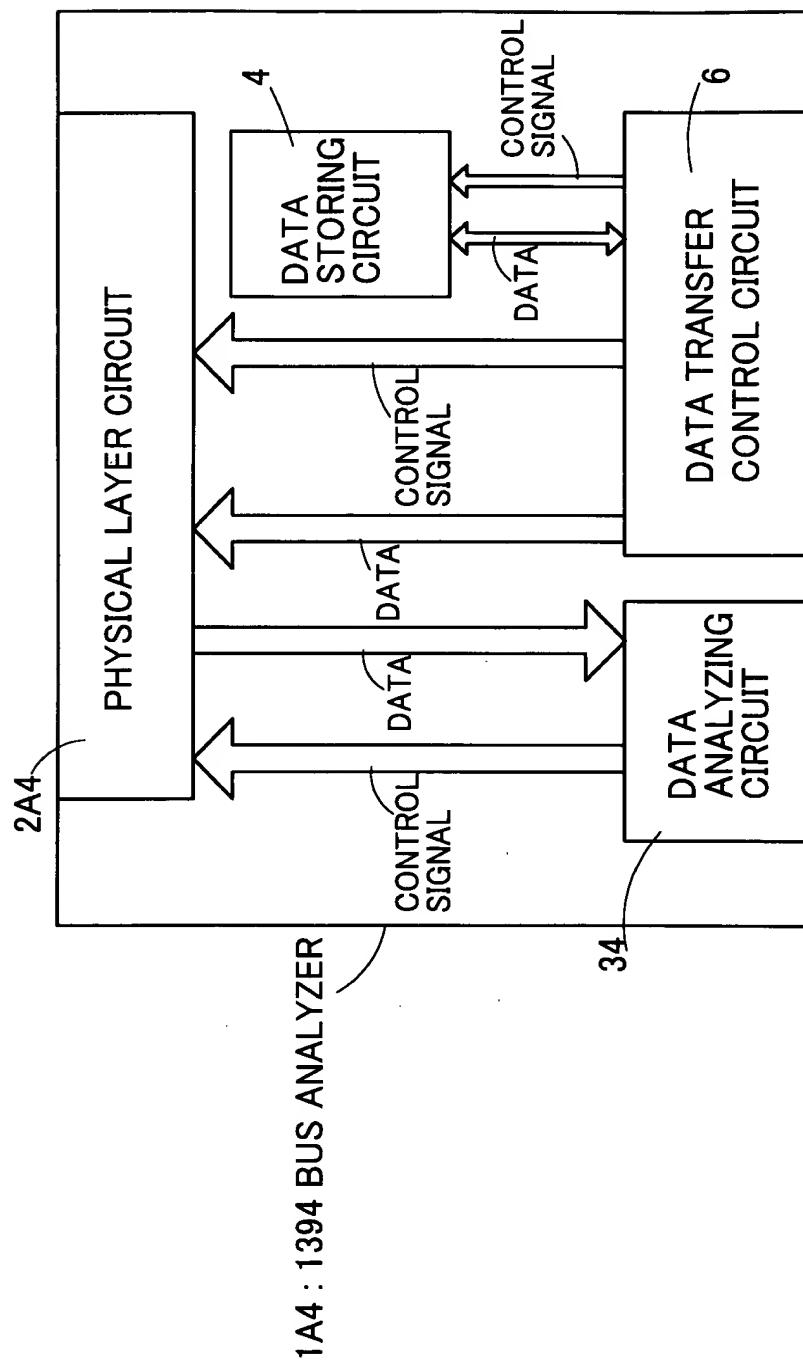


FIG. 13

FIFTH MODIFICATION OF BUS ANALYZER IN FIRST EMBODIMENT

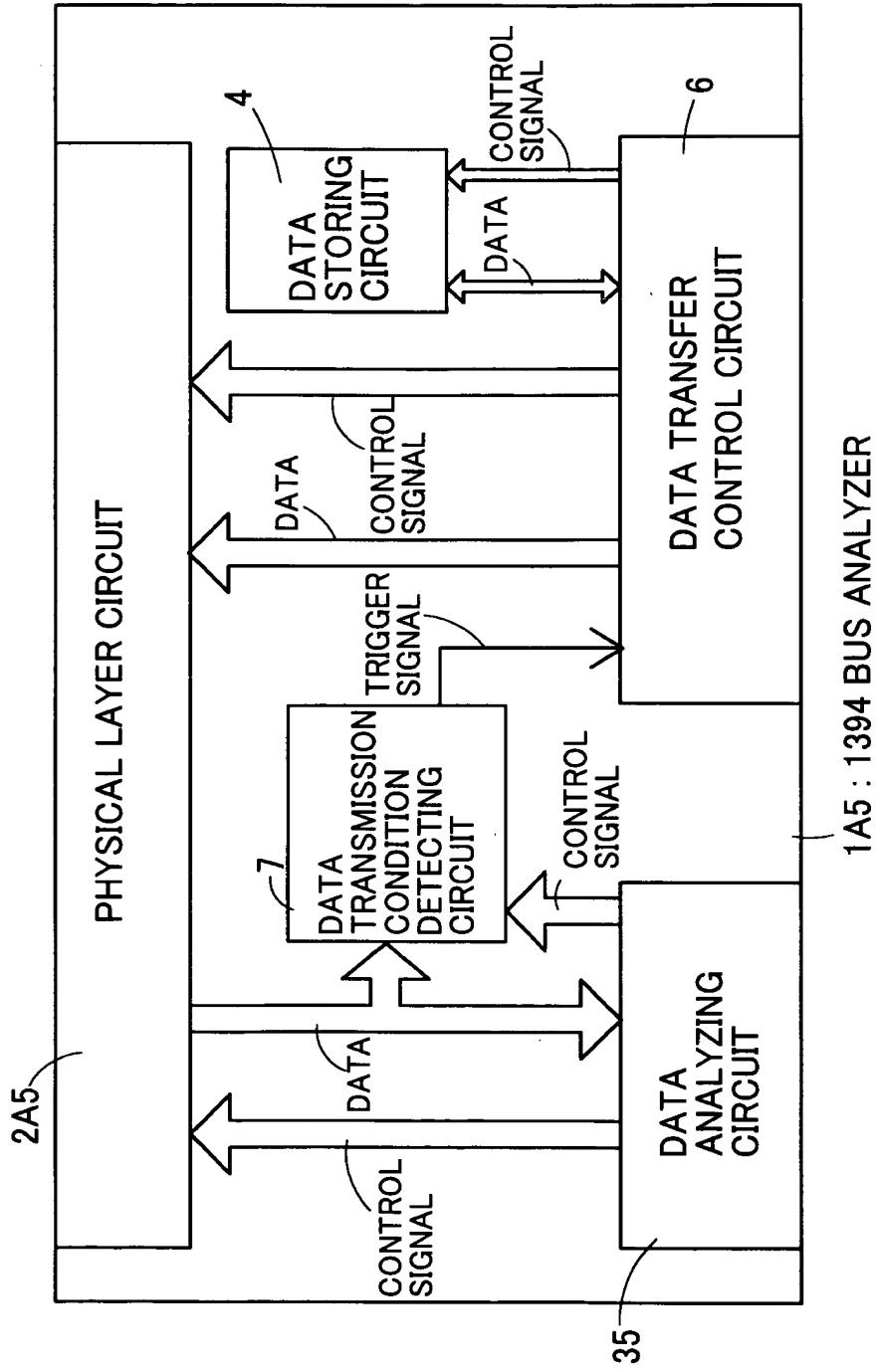


FIG. 14 SIXTH MODIFICATION OF BUS ANALYZER IN FIRST EMBODIMENT

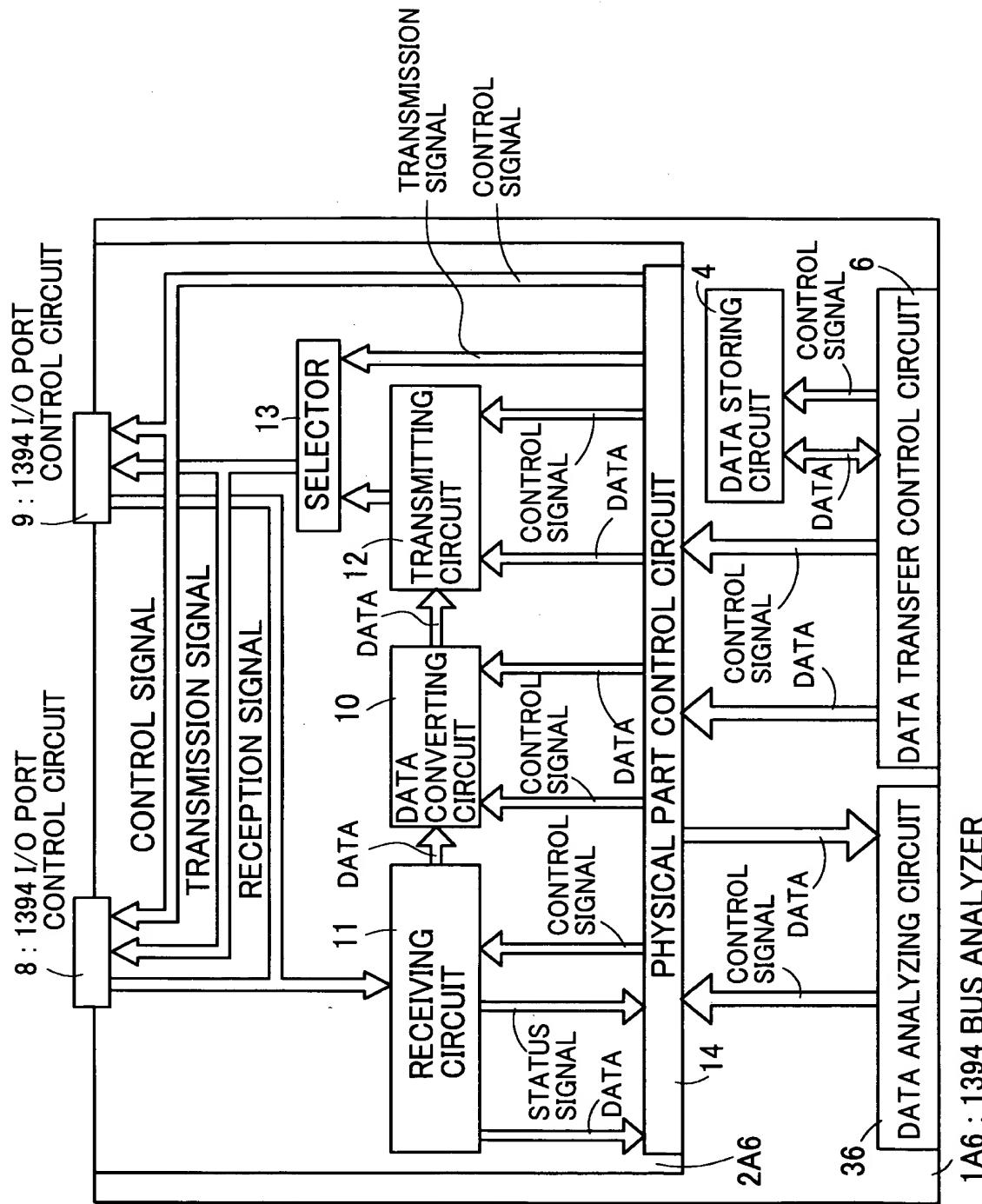


FIG. 15

FIRST CONSTRUCTION EXAMPLE OF IEEE 1394 BUS TO WHICH
BUS ANALYZER OF SECOND EMBODIMENT IS CONNECTED

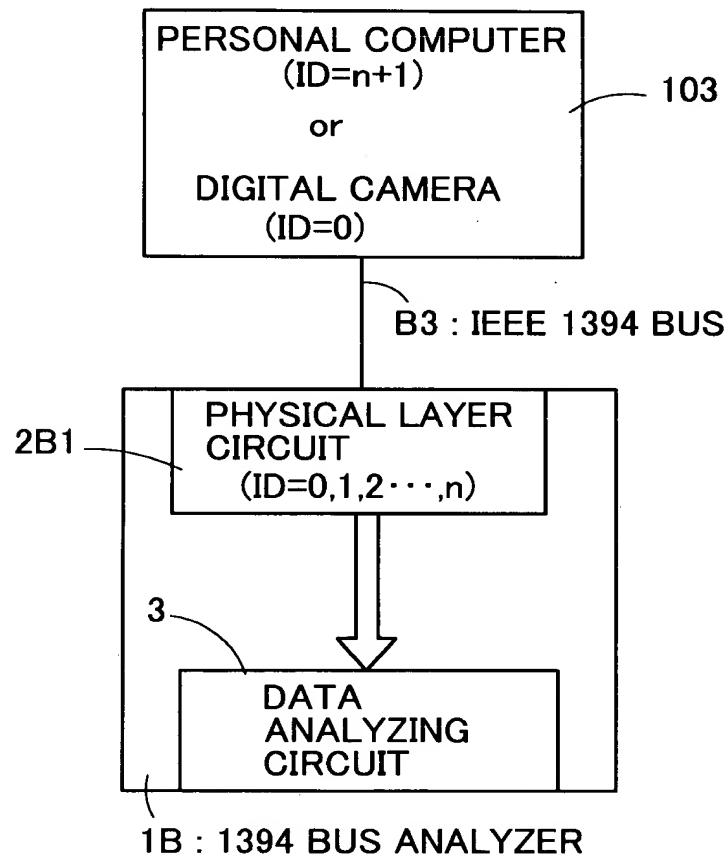


FIG. 16

STATE TRANSITION DIAGRAM SHOWING SELF-IDENTIFYING OPERATION IN FIRST CONSTRUCTION EXAMPLE OF SECOND EMBODIMENT

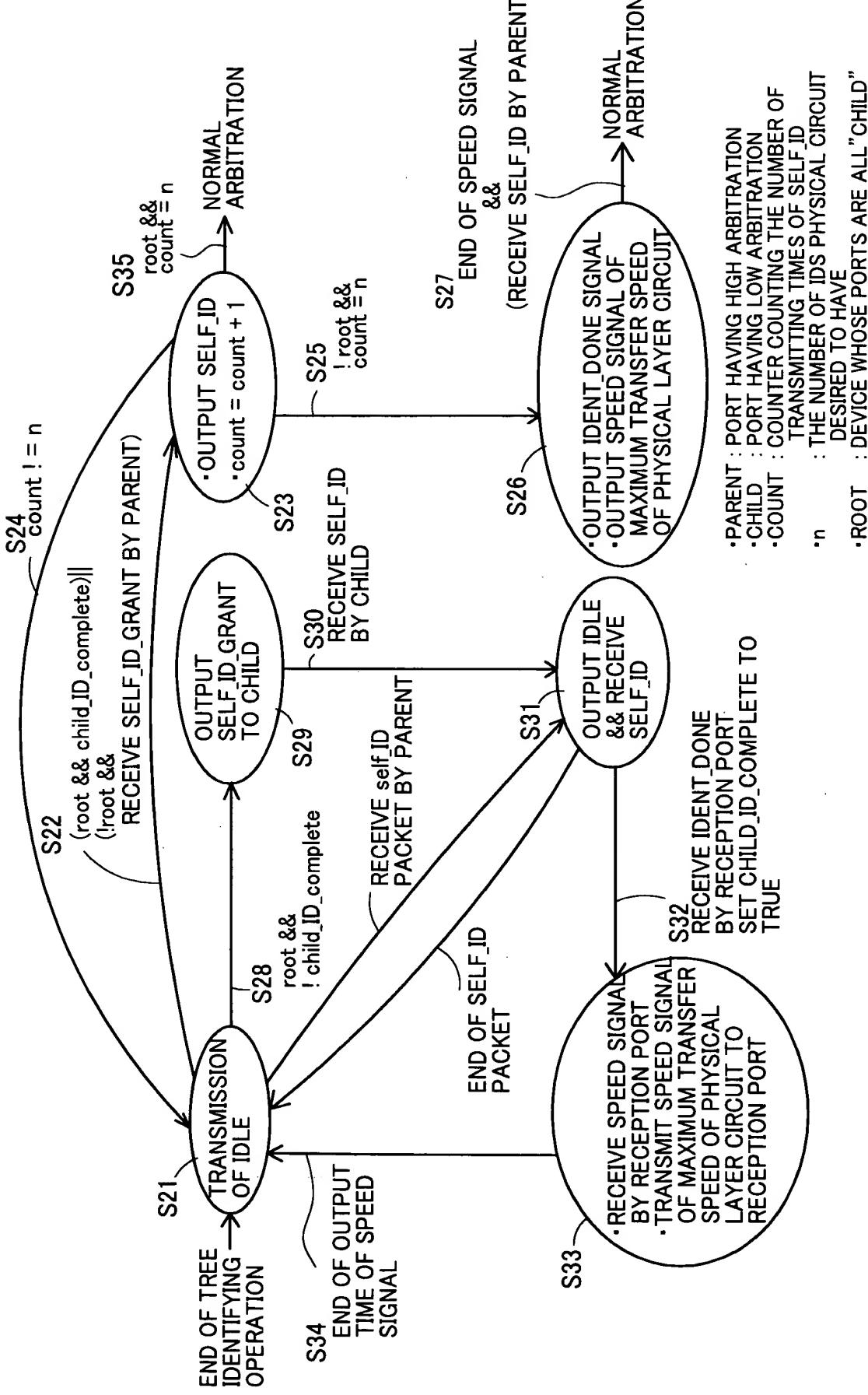
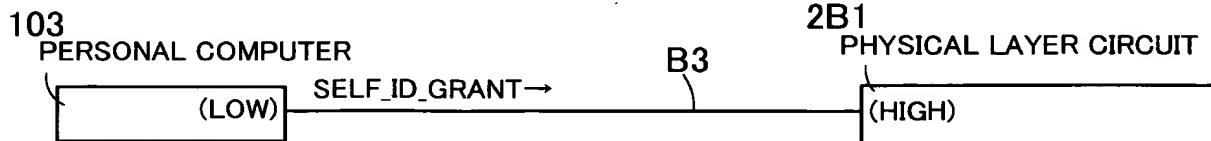


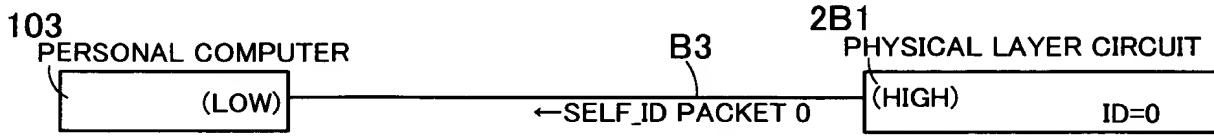
FIG. 17

SELF-IDENTIFYING OPERATION IN FIRST CONSTRUCTION EXAMPLE OF SECOND EMBODIMENT (IN THE CASE WHERE DEVICE CONNECTED ON THE OTHER SIDE HAS HIGH ARBITRATION)

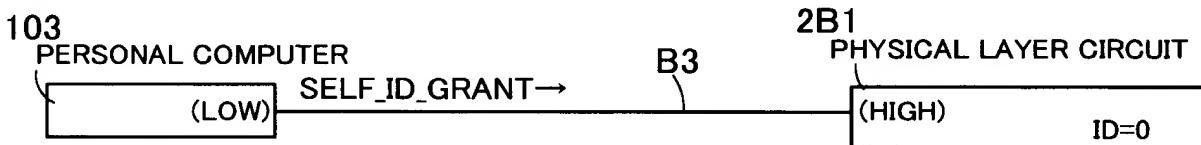
(P21) RECEIVE SELF_ID_GRANT FROM PERSONAL COMPUTER



(P22) OUTPUT SELF_ID PACKET OF ID = 0 TO PERSONAL COMPUTER



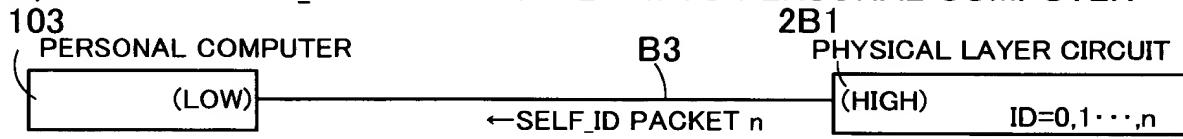
(P23) RECEIVE SELF_ID_GRANT FROM PERSONAL COMPUTER



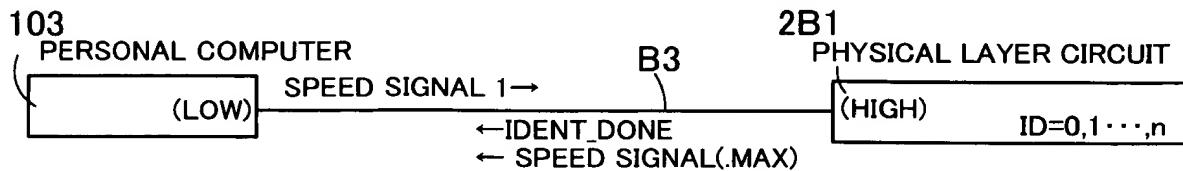
(P24) OUTPUT SELF_ID PACKET OF ID = 1 TO PERSONAL COMPUTER



(P25) OUTPUT SELF ID PACKET OF ID = n TO PERSONAL COMPUTER



(P26) OUTPUT IDENT DONE AND SPEED SIGNAL OF MAXIMUM TRANSFER SPEED OF PHYSICAL LAYER CIRCUIT TO PERSONAL COMPUTER AND RECEIVE SPEED SIGNAL 1 FROM PERSONAL COMPUTER



(P27) RECEIVE SELF_ID PACKET OF ID = (N+1) FROM PERSONAL COMPUTER AND FINISH SELF-IDENTIFYING OPERATION

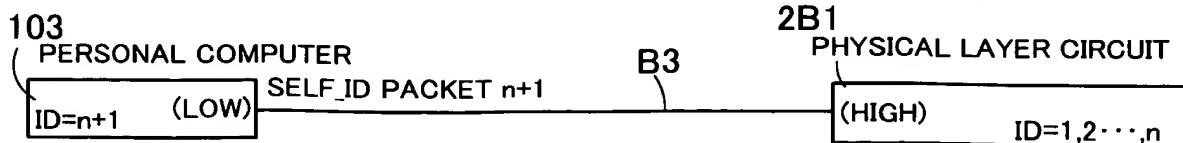


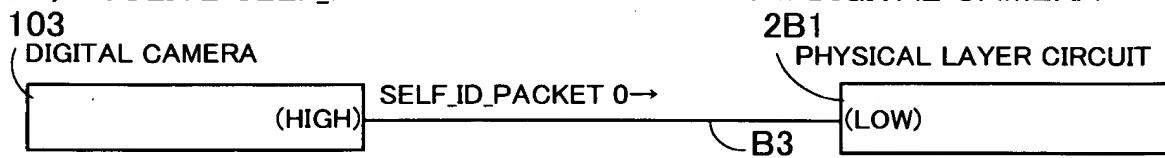
FIG. 18

SELF-IDENTIFYING OPERATION IN FIRST CONSTRUCTION EXAMPLE OF SECOND EMBODIMENT (IN THE CASE WHERE ARBITRATION OF DEVICE CONNECTED ON THE OTHER SIDE IS LOW)

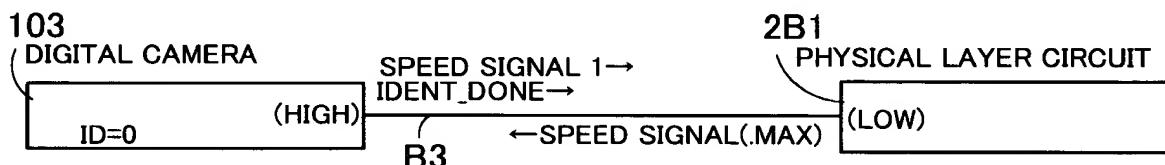
(P28) OUTPUT SELF_ID_GRANT TO DIGITAL CAMERA



(P29) RECEIVE SELF_ID PACKET OF ID = 0 FROM DIGITAL CAMERA



(P30) RECEIVE IDENT_DONE AND SPEED SIGNAL FROM DIGITAL CAMERA AND OUTPUT MAXIMUM SPEED SIGNAL TO DIGITAL CAMERA



(P31) OUTPUT SELF_ID PACKET OF ID = 1 TO DIGITAL CAMERA

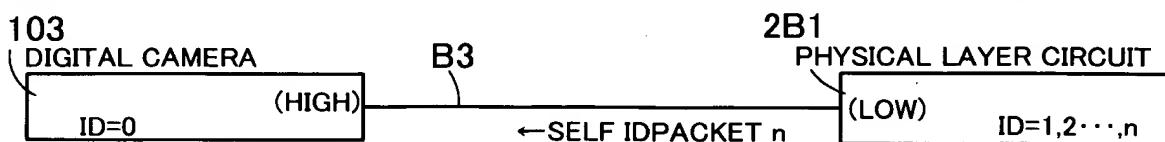


(P32) OUTPUT SELF_ID PACKET OF ID = 2 TO DIGITAL CAMERA



⋮

(P33) OUTPUT SELF_ID PACKET OF ID = n TO DIGITAL CAMERA



(P34) STOP OUTPUTTING SELF_ID PACKET AND FINISH SELF-IDENTIFYING OPERATION



FIG. 19

SECOND CONSTRUCTION EXAMPLE OF IEEE 1394 BUS TO WHICH BUS
ANALYZER OF SECOND EMBODIMENT IS CONNECTED

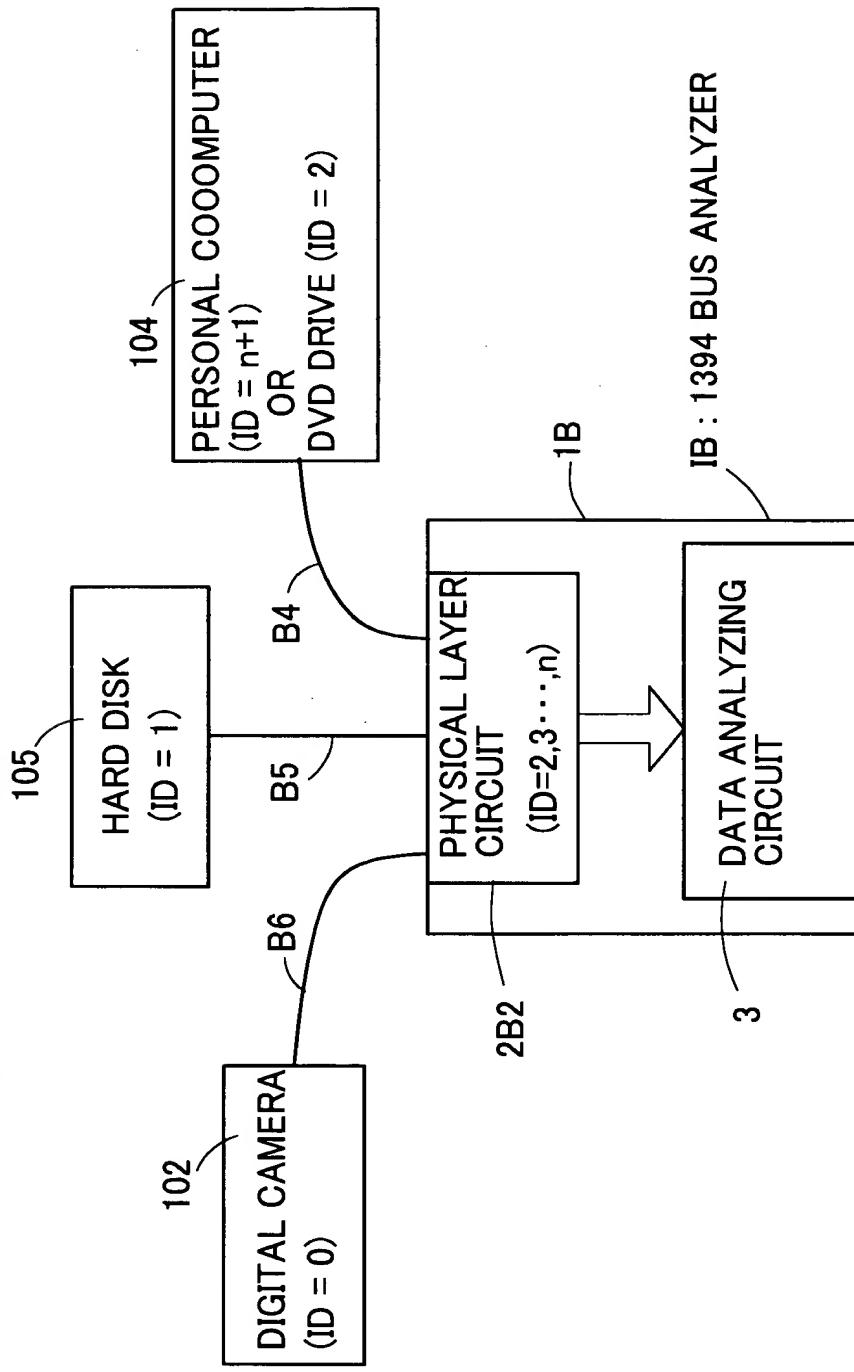
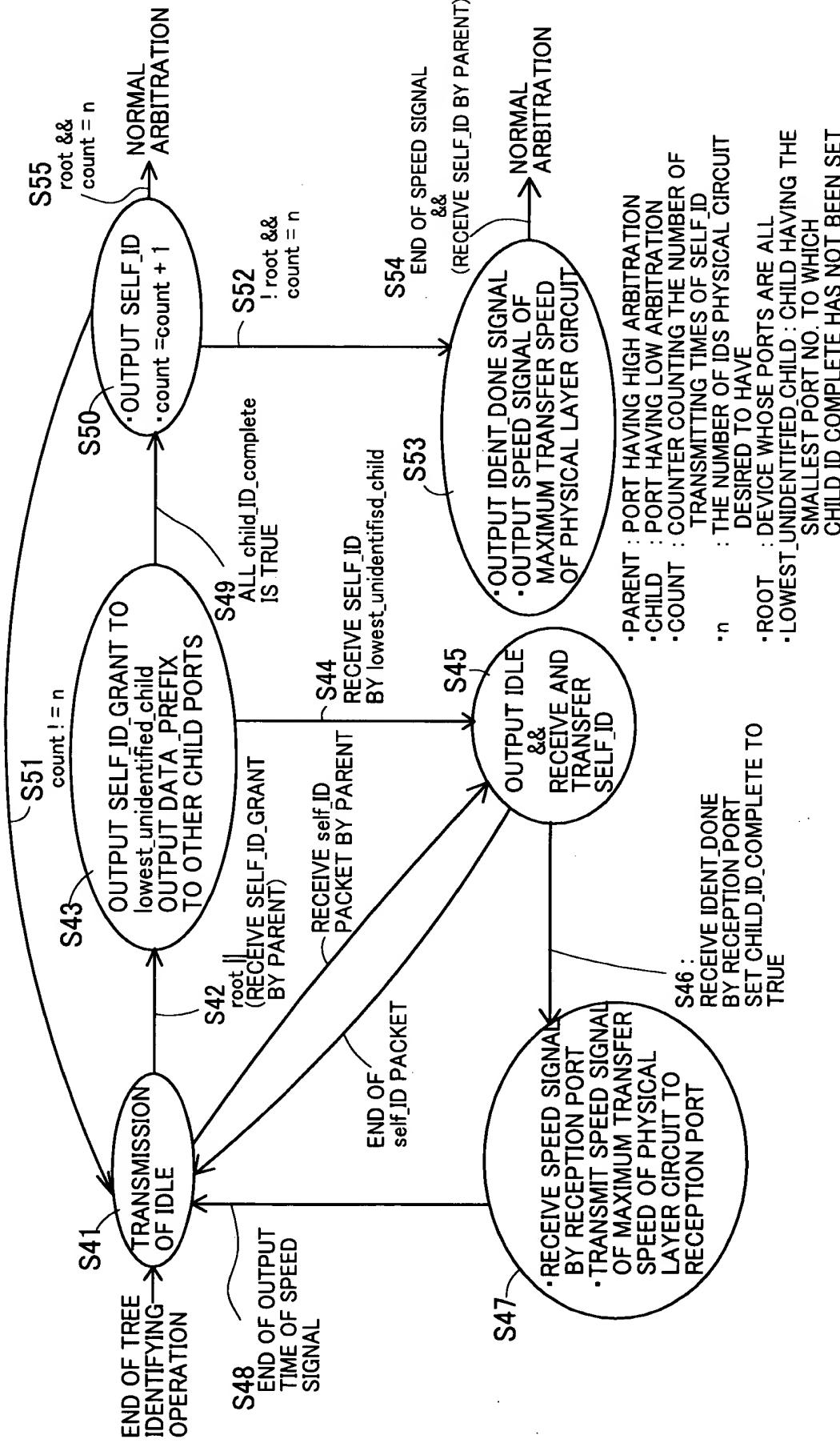


FIG. 20

STATE TRANSITION DIAGRAM SHOWING SELF-IDENTIFYING OPERATION IN SECOND CONSTRUCTION EXAMPLE OF SECOND EMBODIMENT

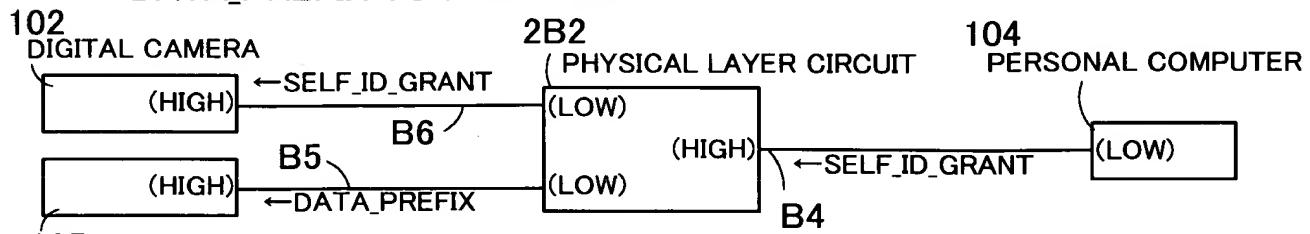


• PARENT : PORT HAVING HIGH ARBITRATION
 • CHILD : PORT HAVING LOW ARBITRATION
 • COUNT : COUNTER COUNTING THE NUMBER OF
 TRANSMITTING TIMES OF SELF_ID
 • n : THE NUMBER OF IDS PHYSICAL CIRCUIT
 DESIRED TO HAVE
 • ROOT : DEVICE WHOSE PORTS ARE ALL
 • LOWEST_UNIDENTIFIED_CHILD : CHILD HAVING THE
 SMALLEST PORT NO. TO WHICH
 CHILD_ID_COMPLETE HAS NOT BEEN SET

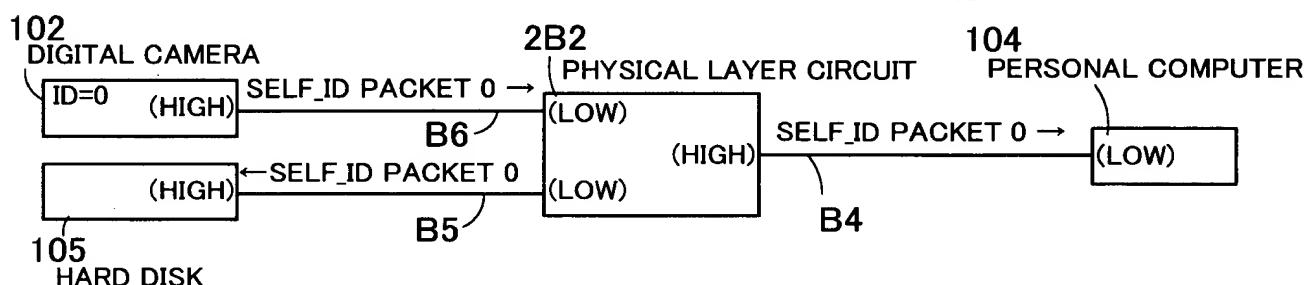
FIG. 21

SELF-IDENTIFYING OPERATION (1) IN SECOND CONSTRUCTION
EXAMPLE OF SECOND EMBODIMENT (IN THE CASE WHERE DEVICE
CONNECTED ON THE OTHER SIDE HAS DEVICE HAVING HIGH ARBITRATION)

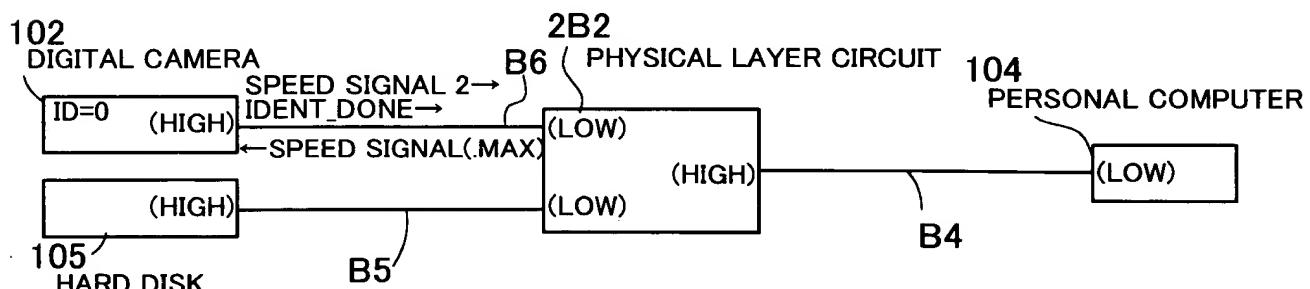
- (P41) RECEIVE SELF_ID_GRANT FROM PERSONAL COMPUTER, OUTPUT SELF_ID_GRANT TO DIGITAL CAMERA AND OUTPUT DATA_PREFIX TO HARD DISK



- (P42) RECEIVE SELF_ID PACKET OF ID = 0 FROM DIGITAL CAMERA AND OUTPUT IT TO PERSONAL COMPUTER AND HARD DISK



- (P43) RECEIVE IDENT_DONE AND SPEED SIGNAL FROM DIGITAL CAMERA AND OUTPUT SPEED SIGNAL OF MAXIMUM TRANSFER SPEED OF PHYSICAL LAYER CIRCUIT TO DIGITAL CAMERA



- (P44) RECEIVE SELF_ID_GRANT FROM PERSONAL COMPUTER, OUTPUT SELF_ID_GRANT TO HARD DISK AND OUTPUT DATA_PREFIX TO DIGITAL CAMERA

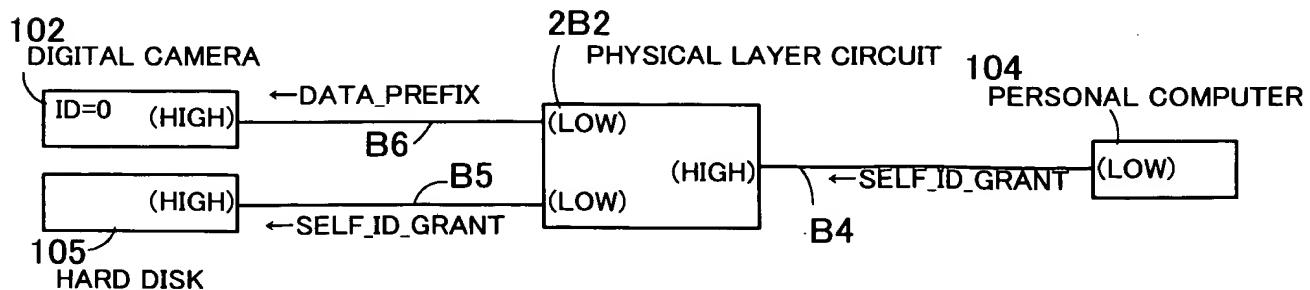
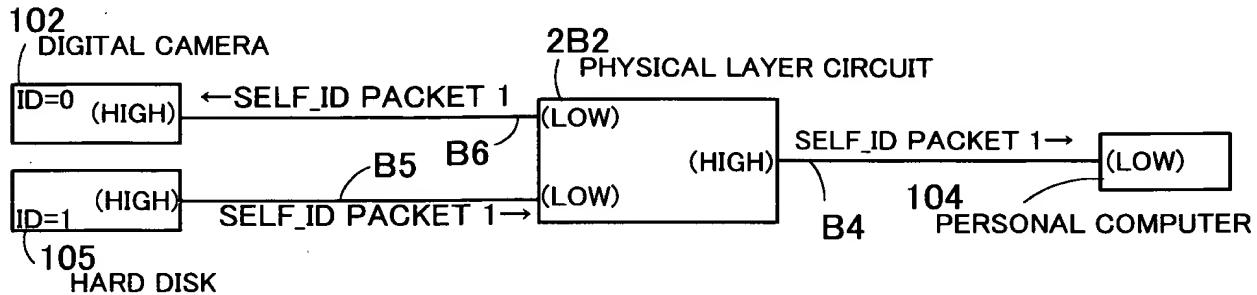


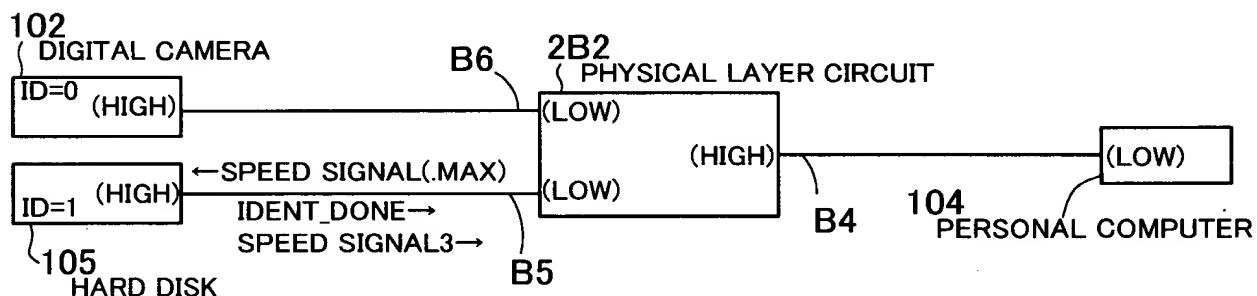
FIG. 22

SELF-IDENTIFYING OPERATION (2) IN SECOND CONSTRUCTION EXAMPLE OF SECOND EMBODIMENT (IN THE CASE WHERE DEVICE CONNECTED ON THE OTHER SIDE HAS DEVICE HAVING HIGH ARBITRATION)

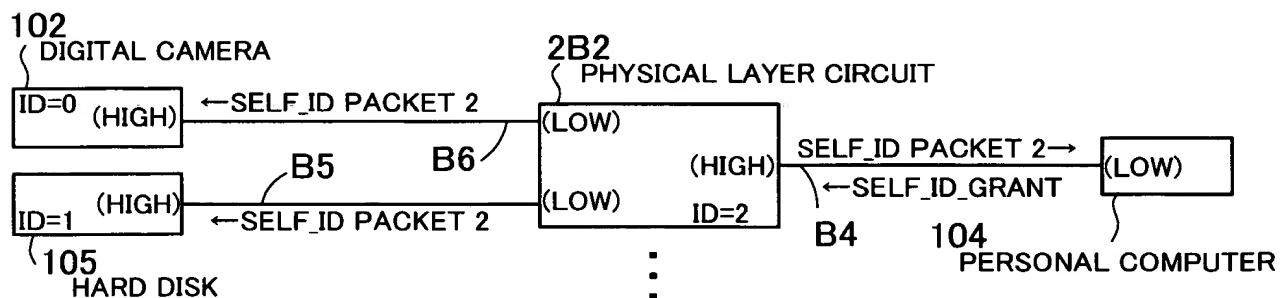
(P45) RECEIVE SELF_ID PACKET OF ID = 1 FROM HARD DISK AND TRANSFER IT TO PERSONAL COMPUTER AND DIGITAL CAMERA



(P46) RECEIVE IDENT_DONE AND SPEED SIGNAL FROM HARD DISK AND OUTPUT SPEED SIGNAL OF MAXIMUM TRANSFER SPEED OF PHYSICAL LAYER CIRCUIT TO HARD DISK



(P47) RECEIVE SELF_ID_GRANT FROM PERSONAL COMPUTER AND TRANSMIT SELF_ID PACKET OF ID = 2 TO ALL PORTS



(P48) RECEIVE SELF_ID_GRANT FROM PERSONAL COMPUTER AND TRANSMIT SELF_ID PACKET OF ID = n TO ALL PORTS

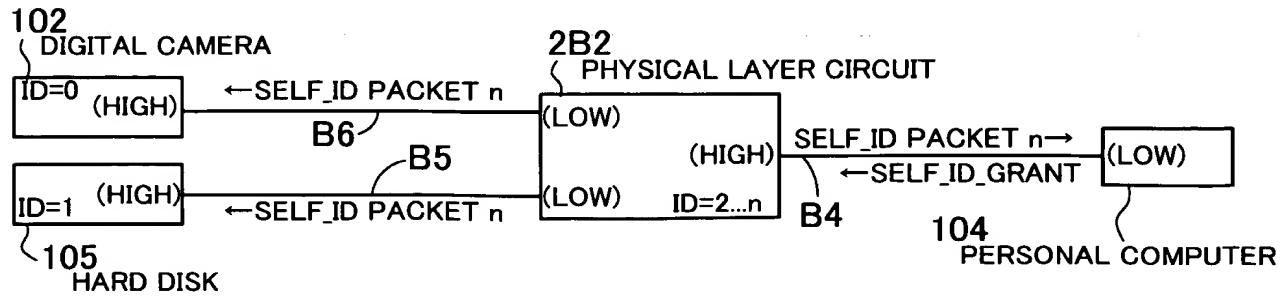
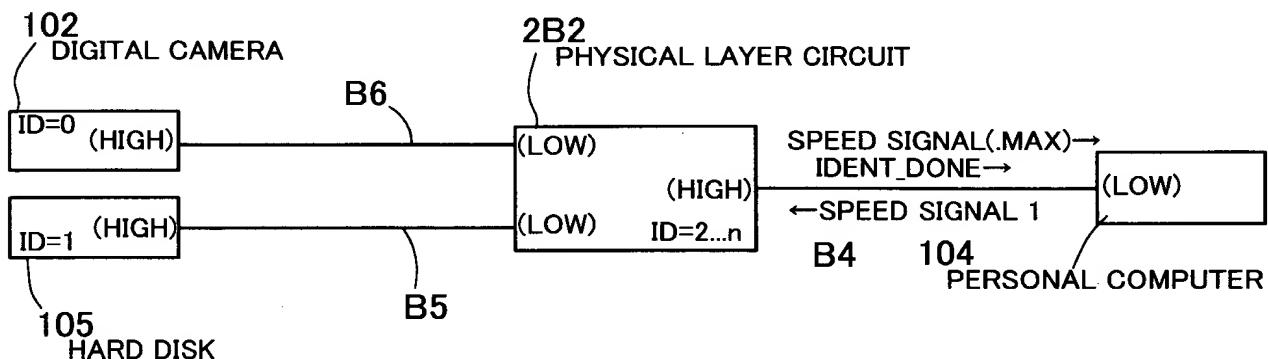


FIG. 23

SELF-IDENTIFYING OPERATION (3) IN SECOND CONSTRUCTION EXAMPLE OF SECOND EMBODIMENT (IN THE CASE WHERE DEVICE CONNECTED ON THE OTHER SIDE HAS DEVICE HAVING HIGH ARBITRATION)

(P49) OUTPUT IDENT DONE AND SPEED SIGNAL OF MAXIMUM TRANSFER SPEED OF PHYSICAL LAYER CIRCUIT TO PERSONAL COMPUTER AFTER TRANSMITTING PACKET AND RECEIVE SPEED SIGNAL FROM PERSONAL COMPUTER



(P50) RECEIVE SELF_ID PACKET OF ID = (n+1) FROM PERSONAL COMPUTER, FINISH SELF-IDENTIFYING OPERATION AND TRANSFER PACKET TO DIGITAL CAMERA AND HARD DISK

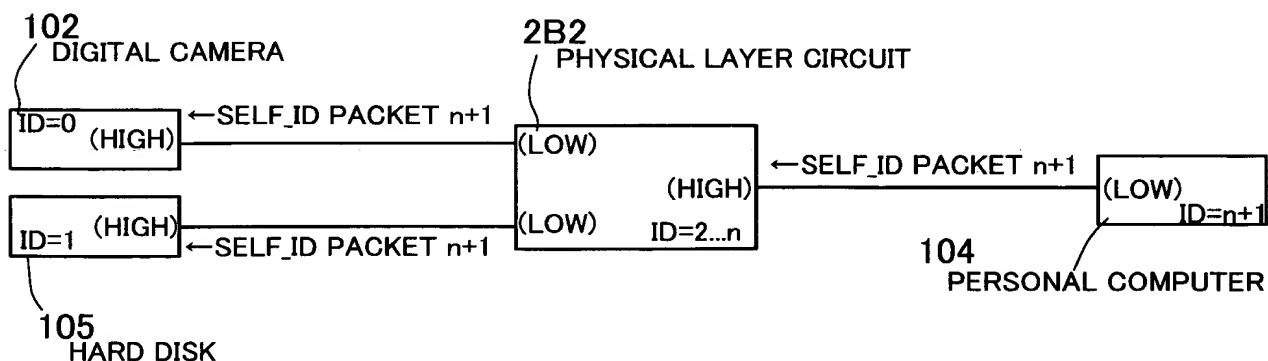
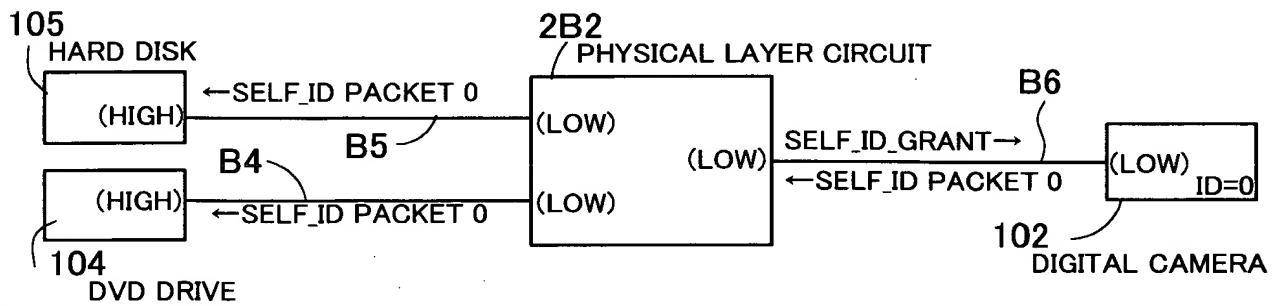


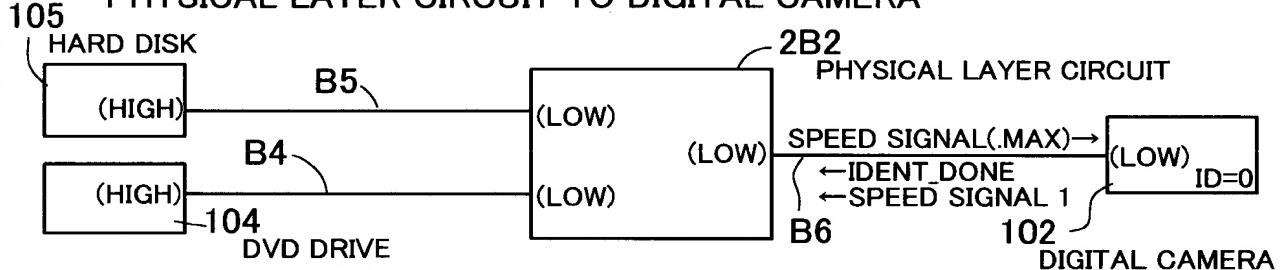
FIG. 24

SELF-IDENTIFYING OPERATION (1) IN SECOND CONSTRUCTION
EXAMPLE OF SECOND EMBODIMENT (IN THE CASE WHERE DEVICE
CONNECTED ON THE OTHER SIDE DOES NOT HAVE DEVICE HAVING
HIGH ARBITRATION)

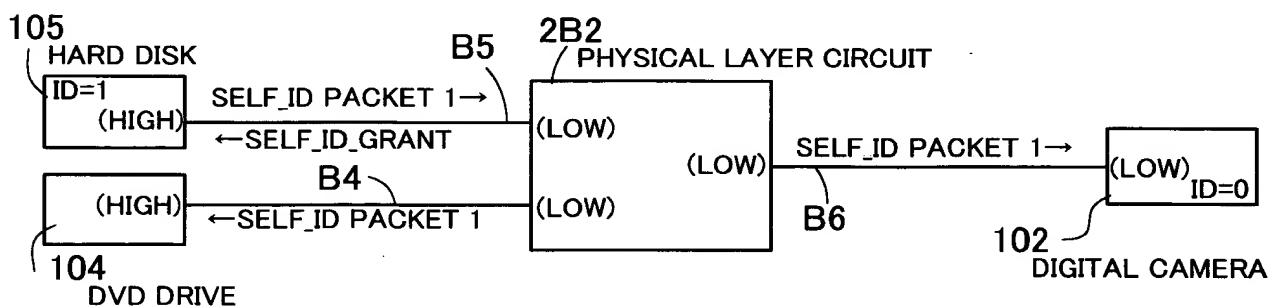
- (P51) OUTPUT SELF_ID_GRANT TO DIGITAL CAMERA, RECEIVE SELF_ID
PACKET FROM DIGITAL CAMERA, AND TRANSFER IT TO HARD DISK
AND DVD DRIVE



- (P52) RECEIVE IDENT_DONE AND SPEED SIGNAL FROM DIGITAL CAMERA
AND OUTPUT SPEED SIGNAL OF MAXIMUM TRANSFER SPEED OF
PHYSICAL LAYER CIRCUIT TO DIGITAL CAMERA



- (P53) OUTPUT SELF_ID_GRANT TO HARD DISK, RECEIVE SELF_ID PACKET
OF ID = 1 FROM HARD DISK, AND TRANSFER IT TO DIGITAL CAMERA
AND DVD DRIVE



- (P54) RECEIVE IDENT_DONE AND SPEED SIGNAL FROM HARD DISK AND
OUTPUT SPEED SIGNAL OF MAXIMUM TRANSFER SPEED OF
PHYSICAL LAYER CIRCUIT TO HARD DISK

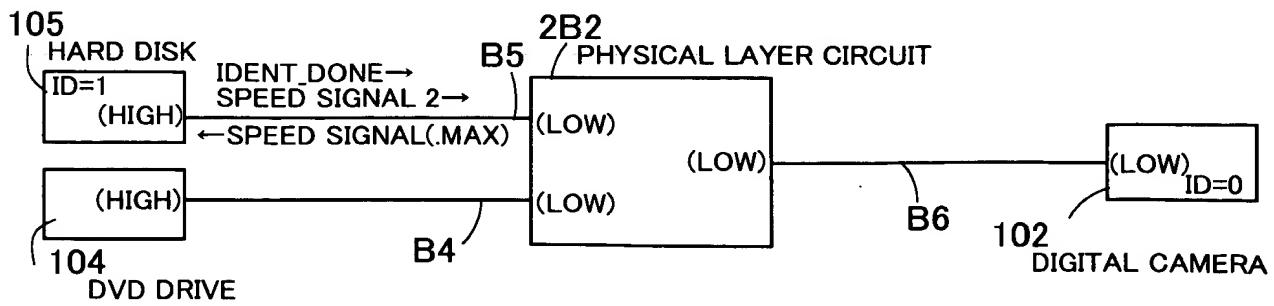
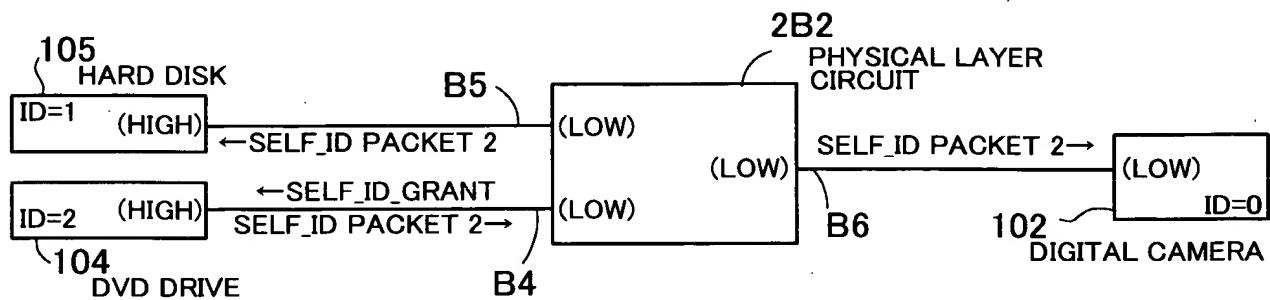


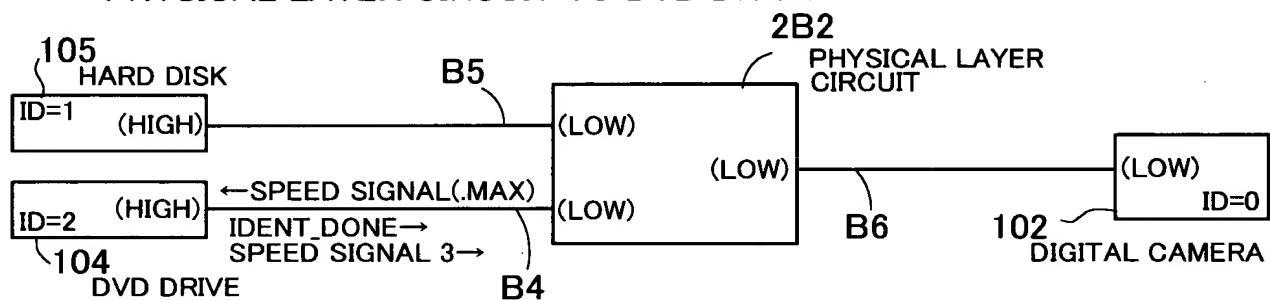
FIG. 25

SELF-IDENTIFYING OPERATION (2) IN SECOND CONSTRUCTION EXAMPLE
OF SECOND EMBODIMENT (IN THE CASE WHERE DEVICE CONNECTED ON THE
OTHER SIDE DOES NOT HAVE DEVICE HAVING HIGH ARBITRATION)

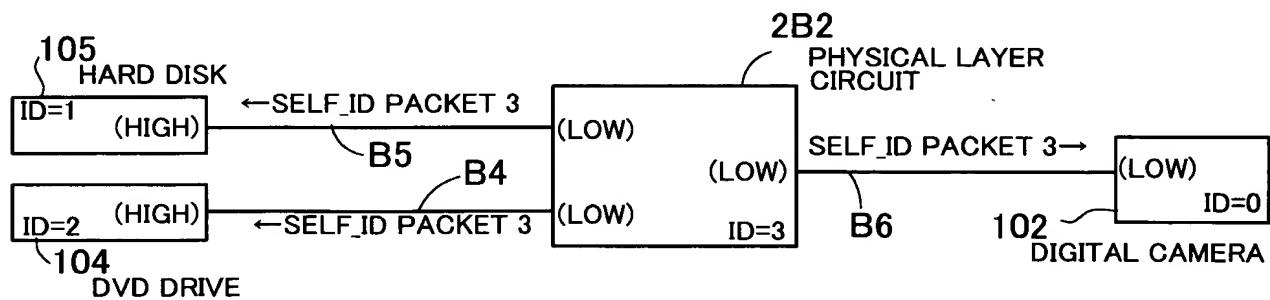
(P55) OUTPUT SELF_ID GRANT TO DVD, RECEIVE SELF_ID PACKET FROM
DVD DRIVE, AND TRANSFER IT TO DIGITAL CAMERA AND HARD DISK



(P56) RECEIVE IDENT_DONE AND SPEED SIGNAL FROM DVD DRIVE AND
OUTPUT SPEED SIGNAL OF MAXIMUM TRANSFER SPEED OF
PHYSICAL LAYER CIRCUIT TO DVD DRIVE



(P57) OUTPUT SELF_ID PACKET OF ID = 3



(P58) OUTPUT SELF_ID PACKET OF ID = n AND FINISH
SELF-IDENTIFYING OPERATION

